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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/531,142	04/11/2005	Katrin Zschintzsch	CEDE 2139	5075
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

uspatents@senniger.com

Office Action Summary

Application No.

10/531,142

Applicant(s)

ZSCHINTZSCH ET AL.

Examiner

Edna Wong

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 May 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 30-34, 36-38, 40-51 and 53-62 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 30-34, 36-38, 40-51 and 53-62 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

This is in response to the Amendment dated May 11, 2007. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office Action.

Response to Arguments

Specification

The disclosure has been objected to because of minor informalities.

The objection of the disclosure has been withdrawn in view of Applicants' amendment.

Claim Objections

Claims **33-34, 44-45 and 48** have been objected to because of minor informalities.

The objection of claims 33-34, 44-45 and 48 has been withdrawn in view of Applicants' amendment.

Claim Rejections - 35 USC § 112

I. Claims **30-39** have been rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The rejection of claims 30-39 under 35 U.S.C. 112, second paragraph, has been

withdrawn in view of Applicants' amendment.

II. Claims **30-39** have been rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps.

The rejection of claims 30-39 under 35 U.S.C. 112, second paragraph, has been withdrawn in view of Applicants' amendment.

Double Patenting

Claims **30-55** have been provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-27 of copending Application No. 11/105,947 (Zschintzsch et al.).

With regards to claims 35, 39 and 52, the rejection on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-27 of copending Application No. 11/105,947 has been withdrawn in view of Applicants' amendment. Claims 35, 39 and 52 have been cancelled.

With regards to claims 30-34, 36-38, 40-51 and 53-55, the rejection on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-27 of copending Application No. 11/105,947 is as applied in the Office Action dated December 11, 2006 and incorporated herein. The rejection has been maintained for the following reasons:

The provisional double patenting rejection is not the only rejection remaining in at least one of the applications (MPEP § 804).

Claim Rejections - 35 USC § 102/103

I. Claims **30-39** have been rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over **EP 1,001,054** ('054).

The rejection of claims 30-39 under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over EP 1,001,054 ('054) has been withdrawn in view of Applicants' amendment.

II. Claims **40-52** have been rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over **EP 1,001,054** ('054).

The rejection of claims 40-52 under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over EP 1,001,054 ('054) has been withdrawn in view of Applicants' amendment.

III. Claims **53-55** have been rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over **EP 1,001,054** ('054).

The rejection of claims 53-55 under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over EP 1,001,054 ('054) has been withdrawn in view of Applicants' amendment.

Response to Amendment

Specification

The disclosure is objected to because of the following informalities:

page 1, [0001], "CROSS REFERENCE TO RELATED APPLICATION", the words -- filed on October 11, 2002, -- should be inserted after the number "02022718.7,"

Appropriate correction is required.

Double Patenting

Claims **56-62** are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-27 of copending Application No. **11/105,947** (Zschintzsch et al.). Although the conflicting claims are not identical, they are not patentably distinct from each other because the subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows:

immersing a substrate in an aqueous acidic electrolyte comprising:

- (a) tin ions;
- (b) copper ions;
- (c) an alkylsulfonic acid; and

(d) an aliphatic and/or aromatic nonionic wetting agent.

The independent claims of the instant application recites similar limitations, either alone or in combination with their dependent claims, as that of the claims of the copending application wherein the claims of the instant application are encompassed by the claims of the copending application. Therefore, the claims would have been obvious variants over each other.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Method

I. Claims **30-34, 36-38 and 56-60** are rejected under 35 U.S.C. 103(a) as being unpatentable over **WO 02/24979** ('979) and **Dietterle et al.** (US Patent No. 7,179,362 B2) in combination with **Tsuji et al.** (US Patent No. 6,607,653 B1).

Dietterle et al. is the English equivalent of WO 02/24979.

Dietterle teaches a method for electrolytic deposition of bronze (= a tin-copper alloy) [col. 5, lines 52-60] onto a substrate (= coating electronic components) [col. 1,

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lines 4-7], the method comprising:

(i) immersing the substrate in an aqueous acidic electrolyte having a pH less than about 1 (col. 5, line 45) and comprising:

- (a) tin ions (col. 4, lines 51-61);
- (b) copper ions (col. 4, line 65 to col. 5, line 3);
- (c) an alkylsulfonic acid (col. 5, lines 32-44);
- (d) a nonionic wetting agent (col. 5, lines 22-26); and
- (e) an oxidation inhibitor (col. 5, lines 13-17);

wherein a ratio of tin ion concentration (= an amount of 5 to 200 g/l electrolyte) [col. 4, lines 62-64] to copper ion concentration (= 0.05 to 50 g/l electrolyte) [col. 5, lines 4-6] is sufficient to electrolytically deposit a bronze having a copper content of greater than about 60% (= the tin-copper alloys applied using this method can contain copper in an amount of 0.1 to 99.9 wt-%) [col. 5, lines 52-53]; and

(ii) applying a current at a current density (= the current density can be between 0.1 A/dm^2 and 100 A/dm^2) [col. 5, lines 61-62] sufficient to electrolytically deposit bronze having the copper content greater than about 60% onto the substrate (= the tin-copper alloys applied using this method can contain copper in an amount of 0.1 to 99.9 wt-%) [col. 5, lines 52-53].

The alkylsulfonic acid is present in the electrolyte at a concentration of from 140 to 382 g/L of electrolyte (= a concentration of 50 to 300 g/l electrolyte) [col. 5, lines 41-44].

The alkylsulfonic acid comprises methanesulfonic acid (col. 5, lines 32-40) in a concentration of at least about 290 g/L (= a concentration of 50 to 300 g/l electrolyte) [col. 5, lines 41-44].

The oxidation inhibitor is selected from the group consisting of monohydroxybenzene compounds, polyhydroxybenzene compounds, and a combination thereof (col. 5, lines 13-17).

The electrolyte comprises a dihydroxybenzene compound as the oxidation inhibitor (= hydroquinone) [col. 5, lines 13-17].

Tin methanesulfonate is present in the electrolyte (col. 4, lines 60-61) in an amount of from about 5 to about 195 g/L of electrolyte (= an amount of 5 to 200 g/l electrolyte) [col. 4, lines 62-64], thereby providing the tin ions at a concentration of from about 2 to about 75 g/L of electrolyte (*inherent*).

Copper methanesulfonate is present in the electrolyte (col. 5, lines 2-3) in an amount of from about 8 to about 280 g/L of electrolyte (= 0.05 to 50 g/l electrolyte) [col. 5, lines 4-6], thereby providing the copper ions at a concentration of from about 2 to about 70 g/L of electrolyte (*inherent*).

The current density is at least about 7 A/dm² (= the current density can be between 0.1 A/dm² and 100 A/dm²) [col. 5, lines 61-62].

The method of Dietterle differs from the instant invention because Dietterle does not disclose the following:

a. Wherein the electrolyte comprises an aromatic, nonionic wetting agent, as recited in claim 30.

b. Wherein the aromatic, nonionic wetting agent is present in the electrolyte at a concentration of from about 2 to about 40 g/L, as recited in claim 36.

c. Wherein the aromatic, nonionic wetting agent is β -naphthol ethoxylate, as recited in claim 60.

Dietterle teaches that the electrolyte can furthermore contain different additions which are commonly used in acid electrolytes for depositing tin alloys, e.g., grain refining additions, surface-active agents, and/or brightening agents (col. 5, lines 18-21).

Like Dietterle, Tsuji teaches electrodepositing tin-copper alloys. Tsuji teaches that the anionic surfactants may be any of the adducts of EO only, PO only, or both EO and PO of the mentioned alkanol, phenol, naphthol and the like. Specifically, preferable are ethylene oxide adducts of α -naphthol or β -naphthol (i.e., α -naphthol polyethoxylate and the like) [col. 22, lines 7-11]. The amount of the surfactants to be added is preferably about 0.01-100 g/l, more preferably about 0.01-50 g/l (col. 21, lines 52-57).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the electrolyte described by Dietterle with wherein the electrolyte comprises an aromatic, nonionic wetting agent; wherein the aromatic, nonionic wetting agent is present in the electrolyte at a concentration of from about 2 to about 40 g/L; and the aromatic, nonionic wetting agent is β -naphthol ethoxylate because about 0.01-50 g/l of ethylene oxide adducts of α -naphthol or β -naphthol are surfactants

commonly used in acid electrolytes for depositing tin-copper alloys as taught by Tsuji (col. 21, lines 52-57; and col. 22, lines 7-11).

d. Wherein the ratio of tin ion concentration to copper ion concentration is about 40/60, as recited in claim 56.

e. Wherein the ratio of tin ion concentration to copper ion concentration is about 20/80, as recited in claim 57.

f. Wherein the ratio of tin ion concentration to copper ion concentration is about 10/90, as recited in claim 58.

Dietterle teaches that the tin-copper alloys applied using this method can contain copper in an amount of 0.1 to 99.9 wt-%. To allow the alloys to be soldered at low temperatures, they preferably comprise a copper content of 0.5 to 10 wt-%, particularly preferred 2 to 5 wt-%. The copper content can be adjusted, for example, by varying the concentration ratios of the tin and copper salts in the electrolyte, the temperature of the electrolyte and the flow rate of the electrolyte based on the material to be coated (col. 5, lines 52-60).

Dietterle teaches that the electrolytic depositing of copper-tin alloys having copper amounts of approximately 80-90 wt-% (reddish bronze) or 45-60 wt-% Cu (speculum) is known in practice (col. 2, lines 1-6).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the ratio of tin ion concentration to copper ion

concentration described by Dietterle with wherein the ratio of tin ion concentration to copper ion concentration is about 40/60, about 20/80, or about 10/90 because the ratio of tin ion concentration to copper ion concentration is a result-effective variable and one skilled in the art has the skill to calculate the ratio of tin ion concentration to copper ion concentration that would have determined the success of the desired reaction to occur, e.g., copper amounts of approximately 80-90 wt-% (reddish bronze) and 45-60 wt-% Cu is known in practice (MPEP § 2141.03 and § 2144.05(II)(B)).

Electrolyte

II. Claims **40-50 and 61** are rejected under 35 U.S.C. 103(a) as being unpatentable over **WO 02/24979** ('979) and **Dietterle et al.** (US Patent No. 7,179,362 B2) in combination with **Tsuji et al.** (US Patent No. 6,607,653 B1).

Dietterle teaches an aqueous acidic electrolyte comprising:

- (a) tin ions (col. 4, lines 51-61);
- (b) copper ions (col. 4, line 65 to col. 5, line 3);
- (c) an alkylsulfonic acid (col. 5, lines 32-44);
- (d) a nonionic wetting agent (col. 5, lines 22-26); and
- (e) an oxidation inhibitor (col. 5, lines 13-17);

wherein the aqueous acidic electrolyte has a pH less than about 1 (col. 5, line 45) and a ratio of tin ion concentration (= an amount of 5 to 200 g/l electrolyte) [col. 4, lines 62-64] to copper ion concentration (= 0.05 to 50 g/l electrolyte) [col. 5, lines 4-6] is

sufficient to electrolytically deposit a bronze having a tin/copper ratio of about 40/60, about 20/80, or about 10/90 (= the tin-copper alloys applied using this method can contain copper in an amount of 0.1 to 99.9 wt-%) [col. 5, lines 52-53].

The alkylsulfonic acid is present in the electrolyte at a concentration of from 140 to 382 g/L of electrolyte (= a concentration of 50 to 300 g/l electrolyte) [col. 5, lines 41-44].

The alkylsulfonic acid comprises methanesulfonic acid (col. 5, lines 32-40) in a concentration of at least about 290 g/L (= a concentration of 50 to 300 g/l electrolyte) [col. 5, lines 41-44].

The oxidation inhibitor is selected from the group consisting of monohydroxybenzene compounds, polyhydroxybenzene compounds, and a combination thereof (col. 5, lines 13-17).

The electrolyte comprises a dihydroxybenzene compound as the oxidation inhibitor (= hydroquinone) [col. 5, lines 13-17].

The tin ions are present at a concentration of from about 2 to about 75 g/L of electrolyte (= an amount of 5 to 200 g/l electrolyte) [col. 4, lines 62-64], and the copper ions are present at a concentration of from about 2 to about 70 g/L of electrolyte (= an amount of 5 to 200 g/l electrolyte) [col. 4, lines 62-64].

The electrolyte of further comprises a wetting agent selected from the group consisting of an anionic wetting agent, an aliphatic, nonionic wetting agent, and combinations thereof (col. 5, lines 22-26).

The oxidation inhibitor is hydroquinone (col. 5, lines 13-17).

The method of Dietterle differs from the instant invention because Dietterle does not disclose the following:

- a. Wherein the electrolyte comprises an aromatic, nonionic wetting agent, as recited in claim 40.
- b. Wherein the aromatic, nonionic wetting agent is present in the electrolyte at a concentration of from about 2 to about 40 g/L, as recited in claim 46.
- c. Wherein the aromatic, nonionic wetting agent is β -naphthol ethoxylate, as recited in claim 61.

Dietterle teaches that the electrolyte can furthermore contain different additions which are commonly used in acid electrolytes for depositing tin alloys, e.g., grain refining additions, surface-active agents, and/or brightening agents (col. 5, lines 18-21).

Like Dietterle, Tsuji teaches electrodepositing tin-copper alloys. Tsuji teaches that the anionic surfactants may be any of the adducts of EO only, PO only, or both EO and PO of the mentioned alkanol, phenol, naphthol and the like, Specifically, preferable are ethylene oxide adducts of α -naphthol or β -naphthol (i.e., α -naphthol polyethoxylate and the like) [col. 22, lines 7-11]. The amount of the surfactants to be added is preferably about 0.01-100 g/l, more preferably about 0.01-50 g/l (col. 21, lines 52-57).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the electrolyte described by Dietterle with wherein

the electrolyte comprises an aromatic, nonionic wetting agent; and wherein the aromatic, nonionic wetting agent is present in the electrolyte at a concentration of from about 2 to about 40 g/L because about 0.01-50 g/l of ethylene oxide adducts of α -naphthol or β -naphthol are surfactants commonly used in acid electrolytes for depositing tin-copper alloys as taught by Tsuji (col. 21, lines 52-57; and col. 22, lines 7-11).

d. Wherein the electrolyte further comprises a gluconate, as recited in claim 49.

Dietterle teaches that the electrolyte can furthermore contain different additions which are commonly used in acid electrolytes for depositing tin alloys, e.g., grain refining additions, surface-active agents, and/or brightening agents (col. 5, lines 18-21).

Tsuji teaches that complexing agents are used mainly for stabilizing and promoting the dissolution of copper in the bath. Examples of the useful complexing agents include gluconic acid and salts thereof (col. 24, lines 25-36).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the electrolyte described by Dietterle with wherein the electrolyte further comprises a gluconate because gluconic acid and salts thereof would have stabilized and promoted the dissolution of copper in tin-copper alloy plating baths as taught by Tsuji (col. 24, lines 25-36).

III. Claim 51 is rejected under 35 U.S.C. 103(a) as being unpatentable over **WO 02/24979** ('979) and **Dietterle et al.** (US Patent No. 7,179,362 B2) in combination with **Tsuji et al.** (US Patent No. 6,607,653 B1) as applied to claims 40-50 and 61 above, and further in view of **EP 1,001,054** ('054).

WO '979, Dietterle and Tsuji are as applied above and incorporated herein.

The method of Dietterle differs from the instant invention because Dietterle does not disclose wherein the electrolyte further comprises a brightener selected from the group consisting of aromatic carbonyl compounds, α , β -unsaturated carbonyl compounds, and combinations thereof, as recited in claim 51.

Dietterle teaches that the electrolyte can furthermore contain different additions which are commonly used in acid electrolytes for depositing tin alloys, e.g., grain refining additions, surface-active agents, and/or brightening agents (col. 5, lines 18-21).

Like Dietterle, EP '054 teaches electrodepositing tin-copper alloys. EP '054 teaches that the plating bath may be incorporated with one or more of aldehyde compounds as a brightener for a plating film. Examples of the aldehyde compounds include 1-naphthaldehyde, 2-naphthaldehyde, o-chlorobenzaldehyde, m-chlorobenzaldehyde, p-chlorobenzaldehyde, 2,4-dichlorobenzaldehyde, acetaldehyde, salicylaldehyde, 2-thiophenaldehyde, 3-thiophenaldehyde, o-anisaldehyde, m-anisaldehyde, p-anisaldehyde, and salicylaldehyde allyl ether (page 5, [0041]).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the electrolyte described by Dietterle with wherein

the electrolyte further comprises a brightener selected from the group consisting of aromatic carbonyl compounds, α , β -unsaturated carbonyl compounds, and combinations thereof because o-anisaldehyde, m-anisaldehyde and p-anisaldehyde are brighteners commonly used in acid electrolytes for depositing tin-copper alloys as taught by EP '054 (page 5, [0041]).

IV. Claims **53-55 and 62** are rejected under 35 U.S.C. 103(a) as being unpatentable over **WO 02/24979** ('979) and **Dietterle et al.** (US Patent No. 7,179,362 B2) in combination with **Tsuji et al.** (US Patent No. 6,607,653 B1).

Dietterle teaches an aqueous acidic electrolyte containing:

(a) divalent tin ions (= tin (II)) [col. 4, lines 51-61] at a concentration of from about 2 to about 75 g/L of electrolyte (= an amount of 5 to 200 g/l electrolyte) [col. 4, lines 62-64];

(b) divalent copper ions (= copper (II)) [col. 4, line 65 to col. 5, line 3] at a concentration of from about 2 to about 70 g/L of electrolyte (= 0.05 to 50 g/l electrolyte) [col. 5, lines 4-6];

(c) a nonionic wetting agent (col. 5, lines 22-26);

(d) a wetting agent selected from the group consisting of an anionic wetting agent, a nonionic, aliphatic wetting agent, and mixtures thereof (= a non-ionic surfactant) [col. 5, lines 22-26] at a concentration of less than about 10 g/L of electrolyte (= an amount of 0.1 to 50 g/l) [col. 5, lines 30-31];

(e) an oxidation inhibitor selected from the group consisting of monohydroxybenzene compounds, polyhydroxybenzene compounds, and a combination thereof (col. 5, lines 13-17) at a concentration of less than about 5 g/L of electrolyte (= 0.05 to 10 g/l electrolyte) [col. 5, lines 13-17];

(f) a brightener (= brightening agents) [col. 5, line 21] at a concentration;

(g) an alkylsulfonic acid (col. 5, lines 32-44) at a concentration of at least about 140 g/L of electrolyte (= a concentration of 50 to 300 g/l electrolyte) [col. 5, lines 41-44];

wherein the aqueous acidic electrolyte has a pH less than about 1 (col. 5, line 45) and a ratio of tin ion concentration (= an amount of 5 to 200 g/l electrolyte) [col. 4, lines 62-64] to copper ion concentration (= 0.05 to 50 g/l electrolyte) [col. 5, lines 4-6] is sufficient to electrolytically deposit a bronze having a tin/copper ratio of about 40/60, about 20/80, or about 10/90 (= the tin-copper alloys applied using this method can contain copper in an amount of 0.1 to 99.9 wt-%) [col. 5, lines 52-53].

The alkylsulfonic acid comprises methanesulfonic acid (col. 5, line 34).

The alkylsulfonic acid comprises methanesulfonic acid (col. 5, line 34) in a concentration of at least about 290 g/L (= at a concentration of 50 to 300 g/l electrolyte) [col. 5, lines 41-44].

The method of Dietterle differs from the instant invention because Dietterle does not disclose the following:

a. Wherein the electrolyte contains an aromatic, nonionic wetting agent at a concentration of from about 2 to about 40 g/L of electrolyte, as recited in claim 53.

Dietterle teaches that the electrolyte can furthermore contain different additions which are commonly used in acid electrolytes for depositing tin alloys, e.g., grain refining additions, surface-active agents, and/or brightening agents (col. 5, lines 18-21).

Like Dietterle, Tsuji teaches electrodepositing tin-copper alloys. Tsuji teaches that the anionic surfactants may be any of the adducts of EO only, PO only, or both EO and PO of the mentioned alkanol, phenol, naphthol and the like, Specifically, preferable are ethylene oxide adducts of α -naphthol or β -naphthol (i.e., α -naphthol polyethoxylate and the like) [col. 22, lines 7-11]. The amount of the surfactants to be added is preferably about 0.01-100 g/l, more preferably about 0.01-50 g/l (col. 21, lines 52-57).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the electrolyte described by Dietterle with wherein the electrolyte contains an aromatic, nonionic wetting agent at a concentration of from about 2 to about 40 g/L of electrolyte because about 0.01-50 g/l of ethylene oxide adducts of α -naphthol or β -naphthol are surfactants commonly used in acid electrolytes for depositing tin-copper alloys as taught by Tsuji (col. 21, lines 52-57; and col. 22, lines 7-11).

b. Wherein the electrolyte contain a stabilizer, complexing agent, or mixture thereof at a concentration of less than about 50 g/L of electrolyte, as recited in claim 53.

Tsuji teaches that complexing agents are used mainly for stabilizing and promoting the dissolution of copper in the bath (col. 24, lines 25-36). The concentration of the above additives in the alloy plating bath containing tin and copper of the present invention may be suitably selected depending on the method by which the plating bath is used, such as the barrel plating, rack plating, high-speed continuous plating, rackless plating and the like (col. 24, lines 42-47).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the electrolyte described by Dietterle with wherein the electrolyte contain a stabilizer, complexing agent, or mixture thereof at a concentration of less than about 50 g/L of electrolyte because a complexing agent would have stabilized and promoted the dissolution of copper in the bath as taught by Tsuji (col. 24, lines 25-36).

The concentration of the complexing agent is a result-effective variable and one skilled in the art has the skill to calculate the concentration of the complexing agents that would have determined the success of the desired reaction to occur (MPEP § 2141.03 and § 2144.05(II)(B)).

c. Wherein the concentration of the brightener is less than about 5 g/L of electrolyte, as recited in claim 53.

Dietterle teaches brightening agents (col. 5, line 21).

Tsuji teaches that the concentration of the above additives in the alloy plating

bath containing tin and copper of the present invention may be suitably selected depending on the method by which the plating bath is used, such as the barrel plating, rack plating, high-speed continuous plating, rackless plating and the like (col. 24, lines 42-47).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the concentration of the brightener described by Dietterle with wherein the concentration of the brightener is less than about 5 g/L of electrolyte because the concentration of the complexing agent is a result-effective variable and one skilled in the art has the skill to calculate the concentration of the complexing agents that would have determined the success of the desired reaction to occur (MPEP § 2141.03 and § 2144.05(II)(B)).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edna Wong whose telephone number is (571) 272-1349. The examiner can normally be reached on Mon-Fri 7:30 am to 4:00 pm.

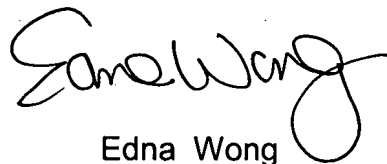
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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A handwritten signature in black ink, appearing to read "Edna Wong", with a stylized, flowing script.

Edna Wong
Primary Examiner
Art Unit 1753

EW
June 21, 2007